

9. *Brief Notes on the Eodiscids* I, Their Classification with a Description of a New Species and a New Variety.*

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Matthew was the first to classify eodiscids. While he had classified them into four sections in 1896, Raymond established the Eodiscidae in 1913 to include *Eodiscus*, *Goniodiscus* and *Weymouthia*. Later *Pagetia* Walcott, *Delgadoia* Vogdes (= *Delgadodiscus* Kobayashi) and *Hebediscus* Whitehouse were added to them and I myself established the Pagetidae to comprise *Pagetia* and *Dipharus*. For Raymond's *Goniodiscus* Howell proposed *Calodiscus* in 1932, because it was a homonym of Müller and Troschel's *Goniodiscus*, 1842, and subsequently in 1937 Resser pointed out that *Dawsonia* Hartt, 1868, which had long been overlooked, must be used in place of *Calodiscus*, but in my opinion these two are both valid names because *Calodiscus* and *Dawsonia* are different in the number of thoracic segments that they have as well as in other respects.

Recently I¹⁾ re-examined the whole group of eodiscids, and found that *Cobboldites*, *Paradiscus*, *Metadiscus*, *Spinodiscus*, *Brevidiscus*, *Deltadiscus*, *Alemtejoia*, *Eopagetia* and *Mesopagetia* should be added to them. Not counting the eight species²⁾ of which little is known, as well as another eight species³⁾ which were referred to the eodiscidian genera incorrectly, there are forty-five species and three varieties which are classified here into fifteen genera and three subgenera in five

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1) T. Kobayashi, On the Eodiscids (in preparation).

2) *Microdiscus* sp. undt. aff. *M. meeki* by Walcott, 1890, (undescribed).

Microdiscus sp. undt. Toll, 1899.

Microdiscus orientalis Walcott, 1905.

Microdiscus cfr. *sculptus* Hicks by Miquel, 1905, (undescribed).

Microdiscus sp. nov. by Miquel, 1912, (undescribed).

Microdiscus emerici Czarnocki, 1927, (undescribed).

Microdiscus sp. by Reed, 1934, (undescribed).

Calodiscus aff. *oelandicus* Westergård, 1936, (undescribed).

3) *Dolichometopus tatei* Woodward, 1884 " *Lorenzella* ".
Microdiscus subsagittatus Tate, 1892 " *Lorenzella tatei* "
Microdiscus kochi Toll, 1899 *Ciceragnostus*.
Microdiscus lenaicus Toll, 1899 *Ciceragnostus*.
Ptychoparia czekanowski Toll, 1899 *Levisia* ?
Ptychoparia meglitzki Toll, 1899 *Strenuella* ?
Strenuella (?) *attleboroensis vigilans* Matthew, 1899 *Strenuella* ?
Ptychoparia (?) *annio* Cobbold, 1910 *Strenuella*.

families including six subfamilies as below. (Type species of each genus is marked by an asterisk).

Agnostida Kobayashi, 1935.

Microtrilobites, miomeric and isopygous.

Dawsoniidea Kobayashi (nov.) (=Eodiscidea Richter, 1932, pars.)

Agnostida having two or three segments in thorax and regularly furrowed axial lobe of pygidium; eyes and proparian facial sutures occasionally present; basal side-lobes of glabella always absent¹⁾.

I. Eodiscidae Raymond, 1913.

Hypoparian Dawsoniidea with distinct axial lobe and trisegmented thorax.

1 a. Calodiscinae Kobayashi, nov.

Eodiscidae having smooth cephalic border.

1. *Calodiscus* Howell, 1935, em. (= *Goniodiscus* Raymond, 1913).

Eodiscidae with long unfurrowed glabella and furrowed pygidium; nuchal spine absent; borders smooth.

Agnosuts lobatus Hall*, 1847

Microdiscus parkeri Walcott, 1886.

2. *Cobboldites* Kobayashi, nov.

Similar to *Calodiscus*, but pleural and ring furrows obscured on the pygidium.

Microdiscus comleyensis Cobbold*, 1910

Eodiscus simplex Cobbold, 1931,

Cobboldites gracilis Kobayashi, nov. (= *Microdiscus* cfr. *helenae* by Burr in Grabau, 1900, pl. 33, fig. 3).

11 b. Eodiscinae Kobayashi, nov.

Eodiscidae having short glabella, tuberculated cephalic border and unfurrowed pleural lobes of pygidium.

3. *Paradiscus* Kobayashi, nov.

Eodiscidae with no spine on the posterior side of cephalon; transglabellar furrows occasionally present.

*Microdiscus speciosus** Ford*, 1873

Microdiscus helenae Walcott, 1889

Microdiscus robustus Kobayashi, nov. (= *Microdiscus speciosus* by Lake, 1907, pl. 3, fig. 7).

4. *Eodiscus* Matthew, 1896.

Similar to *Paradiscus* but having spines on the posterior side of the cephalon: transglabellar furrows very weak or absent.

Microdiscus pulchellus Hartt, 1884

Microdiscus belli-marginatus Shaler and Foerste, 1888

Microdiscus schucherti Matthew*, 1896

Microdiscus bellimarginatus insularis Matthew, 1899.

11 c. Spinodiscinae Kobayashi, nov.

Eodiscidae having a nuchal spine and crenulated cephalic border.

1) For further distinctions of this superfamily from the Agnostidea, see the next paper.

5. *Metadiscus* Kobayashi, nov.

Spinodiscinae with furrowed pleural lobes of pygidium.

Microdiscus sculptus Hicks*, 1871

Microdiscus haimantensis Reed, 1910

Eodiscus fusifrons Saito, 1934

Calodiscus foveolatus Howell, 1935

Calodiscus oelandicus Westergård, 1936

Metadiscus bunkeiensis Kobayashi, nov.

Metadiscus bunkeiensis sulcatus Kobayashi, nov.

6. *Spinodiscus* Kobayashi, nov.

Similar to *Metadiscus* but having unfurrowed pleural lobes of pygidium.

Microdiscus punctatus Salter*, 1864 (= *Microdiscus eucentrus* Linnarsson, 1883)

Microdiscus scanicus Linnarsson, 1883 (a variety of *punctatus*)

Microdiscus convexus Walcott, 1887

Spinodiscus matthewi Kobayashi, nov. (= *Microdiscus pulchellus* by Matthew, 1896, pl. 17, figs. 8 a).

1 d. *Brevidiscinae* Kobayashi, nov.

Intermediate between the Dawsoniidea and Agnostidea, but tentatively placed here.

7. *Brevidiscus* Kobayashi, nov.

Similar to *Calodiscus* but having a shorter glabella: lunate preglabellar depression and transglabellar furrows occasionally present.

Brevidiscus lunulatus Kobayashi*, nov. (= *Microdiscus lobatus* by Walcott, 1886, pl. 15, fig. 1 a)

Brevidiscus (?) *agnostoides* Kobayashi, nov. (= *Microdiscus lobatus* by Walcott, 1886, pl. 16, fig. 1)

Brevidiscus (?) *troyensis* Kobayashi, nov. (= *Microdiscus lobatus* by Walcott, 1886, pl. 16, fig. 1 a).

II. Dawsoniidae Resser, 1937, em.

Hypoparian Dawsoniidea with crenulated cephalic border and bisegmented thorax.

8. *Dawsonia* Hartt, 1868 (non Nicholson, 1873 and Fritsch, 1879).

Dawsoniidae having longiconic glabella and furrowed pygidium.

Dawsonia dawsoni Hartt*, 1868 (= *Microdiscus dawsoni* Billings)

Dawsonia spinifera Kobayashi, nov. (= *Microdiscus dawsoni* by Matthew, 1896, pl. 17, fig. 5 a-c)

Dawsonia canadensis Kobayashi, nov. (= Pygidium of *Microdiscus praecursor* Matthew, 1896, text-fig.).

9. *Deltadiscus* Kobayashi, nov.

Dawsoniidae with breviconic glabella and median preglabella furrow.

Deltacandus praecursor (Matthew*) (*Eodiscus punctatus praecursor* Matthew, 1885, cephalon only).

III. Dipharidae Kobayashi, nov.

Proparian Dawsoniidea with eyes and depressed lunate cephalic border and trisegmented thorax.

10. *Hebediscus* Whitehouse, 1936.

Dipharidae with eyes and eye-ridges.

Ptychoparia attleboroensis Shaler and Foerste*, 1888

Hebediscus cobboldi Resser, 1937.

11. *Dipharus* Clark, 1923.

Dipharidae with transglabellar furrow and stalked eyes.

Dipharus insperatus Clark*, 1923

Dipharus peculiaris Kobayashi, nov. (= *Pagetia attleboroensis* by Cobbold, 1931, pl. 38, fig. 6).

IV. Pagetiidae Kobayashi, 1935.

Proparian Dawsoniidea with bisegmented thorax.

12. *Pagetia* Walcott, 1916, is the only known genus of the family which is divided into the following three subgenera.12 a. *Eopagetia* Kobayashi, nov.

Pagetia with thoracic segments of the same outline and ribbed pleural lobes of pygidium: median preglabellar furrow absent.

Microdiscus significans Etheridge*, 1902

Eodiscus spiniger Saito, 1934

Eopagetia resseri Kobayashi, nov. (= *Pagetia clytia* by Resser, 1937, pl. 2, fig. 8).

12 b. *Mesopagetia* Kobayashi, nov.

Pagetia with thoracic segments of the same outline: pleural furrows of pygidium weak: median preglabellar furrow occasionally present.

Pagetia clytia Walcott*, 1916

Microdiscus griesbachii Reed, 1910

Pagetia fossula Resser, 1938

Pagetia maladensis Resser, 1939.

12 c. *Pagetia* Walcott, s. str.

Pagetia with median preglabellar furrow and smooth pleural lobes of pygidium: posterior thoracic segment broader than the anterior one and its pleural end pointed antero-laterally.

Pagetia bootes Walcott, 1916.

V. *Weymouthiidae* Kobayashi, nov.

Smooth Dawsoniidea with trisegmented thorax; eyes and facial sutures occasionally present.

V a. *Weymouthiinae* Kobayashi, nov.

Hypoparian *Weymouthiidae* with tuberculated cephalic border.

13. *Weymouthia* Raymond, 1913.

Agnostus (?) *nobilis* Ford*, 1872

V b. *Delgadoiinae* Kobayashi, nov.

Weymouthiidae with eyes and non-tuberculated cephalic border.

14. *Delgadoia* Vodges, 1917 (= *Delgadodiscus* Kobayashi, 1935).

Delgadoiinae with a caudal spine; eyes and proparian facial sutures occasionally present.

Microdiscus caudatus Delgado*, 1904

Microdiscus subcaudatus Delgado, 1904

Microdiscus wenseslaci Delgado, 1904.

15. *Alemtejoia* Kobayashi, nov.

Delgadoiinae with no rows of tubercles on the cephalic border, nor caudal spine; eyes occasionally present.

Microdiscus souzai Delgado, 1904

Microdiscus woodwardi Delgado, 1904

Description of *Metadiscus bunkeiensis* sp. nov. and its variety,
sulcata, var. nov.

Pagetia (*Eopagetia*) sp. nov, Kobayashi and Aoti, Proc. **18** (1942), 305, (listed).

Several detached shields of *Metadiscus bunkeiensis* nov. are contained in the Bunkei collection. Because of the poor state of preservation I thought at first that they had eyes and facial sutures but later found on a better preserved specimen that the parts thought to be the sutures and eyes must be broken margins. Two cephalons at hand are almost identical with that of *M. haimantensis*¹⁾ except for the smooth test of the carapace and presence of faint crenulation on the border seen in one of the two cephalons (fig. 1). On these accounts this species agrees with *M. fusifrons*²⁾ but its occipital spine is very short.

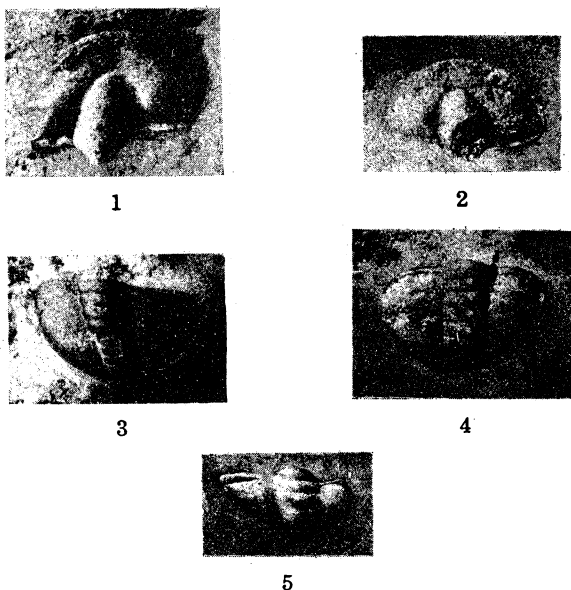


Fig. 1, 3 & 5. *Metadiscus bunkeiensis* Kobayashi, (nov.)

Fig. 2 & 4. *Metadiscus bunkeiensis* var. *sulcata* Kobayashi, (nov.)

The third cephalon (fig. 2), though similar to the preceding, differs in having a pair of lateral furrows and an occipital one, all distinct. Therefore the name, *sulcata*, is proposed here for this cephalon. Though the posterior end of its glabella is broken, its occipital ring is probably not so much projected behind as that of the typical form.

The pygidia from Bunkei can also be classified into two kinds. One (fig. 4), like that of *haimantensis*, has a tubercle on each ring of

1) F.R. Cowper Reed (1910), The Cambrian Fossils of Spiti. *Palaeontol. Indica. ser. 15, vol. 7, Mem. no. 1, p. 7, pl. 1, figs. 12-13.*

2) K. Saito (1934), Older Cambrian Trilobita and Conchostraca from North-Western Korea. *Japan. Jour. Geol. Geogr. vol. 9, 218, pl. 25, figs. 12-16.*

the axial lobe which is lacking in four others. The tuberculated one, however has one or two more rings on the axis than does *haimantensis* and its test is smooth; the non-tuberculate ones (figs. 3 & 5) resembles that of *fusifrons* but the axis is a little broader. Pleural furrows can only be seen in the pygidia at hand only when light is thrown sideways on the specimen.

Because these specimens are fragmentary, it is impossible to determine which pygidium goes with which cephalon, but for the time being the non-tuberculated pygidium is referred to the typical form, the tuberculated one to the varietal form.

Occurrence.:—*Ptychoparia* zone in the Majo formation in the South of Kanairi, Bunkei area, South Chosen.
